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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF FORESTRY—Circular No. 33.

GIFFORD PINCHOT, Forester.

WHAT FORESTRY MEANS TO REPRESENTATIVE MEN.

PORTIONS OF ADDRESSES DELIVERED AT THE AMERICAN FOREST CONGRESS, WASHINGTON, JANUARY 3 TO 6, 1905.

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United States Department of Agriculture,

BUREAU OF FORESTRY—CIRCULAR NO. 33.

GIFFORD PINCHOT, Forester.

U. S. Department of Agriculture,
Bureau of Forestry,
Washington, D. C., February 25. 1905.

Sir: I have the honor to transmit herewith a collection of papers entitled "What Forestry Means to Representative Men," embodying portions of addresses delivered at the American Forest Congress, held in this city January 3 to 6, 1905, and to recommend its publication as Circular No. 33 of the Bureau of Forestry.

Gifford Pinchot,
Forester.

Hon. James Wilson,
Secretary of Agriculture.

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WHAT FORESTRY MEANS TO REPRESENTATIVE MEN.

PRESIDENT ROOSEVELT.

* * * You have made, by your coming [to this congress], a meeting which is without parallel in the history of forestry. * * * For the first time the great business and the forest interests of the Nation have joined together, through delegates altogether worthy of the organizations they represent, to consider their individual and their common interests in the forest. This congress may well be called a meeting of forest users, for that the users of the forest come together to consider how best to combine use with preservation, is the significant fact of the meeting, the fact full of powerful promise for the forests of the future.

* * * If the forest is destroyed it is only a question of a relatively short time before the business interests suffer in consequence. All of you know that there is opportunity in any new country for the development of the type of temporary inhabitant whose idea is to skin the country and go somewhere else. You all know, and especially those of you from the West, the individual whose idea of developing the country is to cut every stick of timber off of it and then leave a barren desert for the homemaker who comes in after him. That man is a curse and not a blessing to the country. The prop of the country must be the business man who intends so to run his business that it will be profitable for his children after him. * * * I do not in the least underrate the power of an awakened public opinion; but in the final test it will be the attitude of the industries of the country which more than anything else will determine whether or not our forests are to be preserved. * * * This is true because by far the greater part of all our forests must pass into the hands of forest users, whether directly or through the Government, which will continue to hold some of them, but only as trustee. The forest is for use, and its users will decide its future. It was only a few years ago that the practical lumberman felt that the forest expert was a man who wished to see the forests preserved as bric-a-brac, and the American business man was not prepared to do much from the bric-

a-brac standpoint. Now, I think we have got a working agreement between the forester and the business man whose business is the use of the forest. We have got them to come together with the understanding that they must work for a common end, work to see the forest preserved for use. The great significance of this congress comes from the fact that henceforth the movement for the conservative use of the forest is to come mainly from within, not from without; from the men who are actively interested in the use of the forest in one way or another, even more than from those whose interest is philanthropic and general.

* * * * * * *

I shall not pretend this afternoon to even describe to you the place of the forest in the life of any nation, and especially its place in the United States. The great industries of agriculture, transportation, mining, grazing, and, of course, lumbering, are each one of them vitally and immediately dependent upon wood, water, or grass from the forest. * * * Wood is an indispensable part of the material structure upon which civilization rests; and it is to be remembered always that the immense increase of the use of iron and substitutes for wood in many structures, while it has meant a relative decrease in the amount of wood used, has been accompanied by an absolute increase in the amount of wood used. More wood is used than ever before in our history. Thus, the consumption of wood in shipbuilding is far larger than it was before the discovery of the art of building iron ships, because vastly more ships are built. * * * There is one point I want to speak about in addition to the uses of the forest to which I have already alluded. Those of us who have lived on the Great Plains, who are acquainted with the conditions in parts of Oklahoma, Nebraska, Kansas, and the Dakotas, know that wood forms an immensely portentous element in helping the farmer on those plains battle against his worst enemy—wind. The use of forests as windbreaks out on the plains where the tree does not grow unless man helps it is of enormous importance, and, Mr. Wilson, among the many services performed by the public-spirited statesman who once occupied the position that you now hold, none was greater than what the late Secretary of Agriculture, Mr. Morton, did in teaching by actual example as well as by precept the people of the treeless regions the immense advantage of the cultivation of trees.

When wood, dead or alive, is demanded in so many ways, and when this demand will undoubtedly increase, it is a fair question, then, whether the vast demands of the future upon our forests are likely to be met. You are mighty poor Americans if your care for the well-being of this country is limited to hoping that that well-being will last out your own generation. No man here or elsewhere is entitled to call himself a decent citizen if he does not try to do his part

toward seeing that our national policies are shaped for the advantage of our children and our children's children. Our country, we have faith to believe, is only at the beginning of its growth. Unless the forests of the United States can be made ready to meet the vast demands which this growth will inevitably bring, commercial disaster, that means disaster to the whole country, is inevitable. * * * If the present rate of forest destruction is allowed to continue, with nothing to offset it, a timber famine in the future is inevitable. Fire, wasteful and destructive forms of lumbering, and the legitimate use, taken together, are destroying our forest resources far more rapidly than they are being replaced. It is difficult to imagine what such a timber famine would mean to our resources. And the period of recovery from the injuries which a timber famine would entail would be measured by the slow growth of the trees themselves. Remember that you can prevent such a timber famine occurring by wise action taken in time, but once the famine occurs there is no possible way of hurrying the growth of the trees necessary to relieve it. * * * This statement is true not only as to forests in private ownership, but as to the national forests as well. Unless the men from the West believe in forest preservation the western forests can not be preserved. We here at the headquarters of the National Government recognize that absolutely. We believe, we know, that it is essential for the well-being of the people of the States of the Great Plains, the States of the Rockies, the States of the Pacific slope, that the forests shall be preserved, and we know also that our belief will count for nothing unless the people of those States themselves wish to preserve the forests. If they do we can help materially; we can direct their efforts, but we can not save the forests unless they wish them to be saved.

I ask, with all the intensity that I am capable of, that the men of the West will remember the sharp distinction I have just drawn between the man who skins the land and the man who develops the country. I am going to work with, and only with, the man who develops the country. I am against the land skinner every time. Our policy is consistent to give to every portion of the public domain its highest possible amount of use, and of course that can be given only through the hearty cooperation of the western people.

* * * * * * *

In closing I wish to thank you who are here, not merely for what you are doing in this particular movement, but for the fact that you are illustrating what I hope I may call the typically American method of meeting questions of great and vital importance to the Nation—the method of seeing whether the individuals particularly concerned can not, by getting together and cooperating with the Government, do infinitely more for themselves than it would be possible for any government under the sun to do for them. * * *

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M. JUSSERAND,

The Ambassador of France.

In France our forests[a] have, as every inhabitant of our country knows, a code of laws. It was first used in 1827, and it embodies the regulations which were enacted by the famous ordinance of 1869. That ordinance reaches far back into the centuries, for it recognizes prescriptions which had been enacted by Charles the Wise in the fourteenth century. In order to keep our forests and to supervise them, they have an army of their own; an army of rangers, foresters, and keepers; an army of 6,000 men, who are subject to military discipline, so that in time of war all this army is available to the minister of war, but in ordinary times it is under the control of the minister of agriculture for service in connection with the forests. Since the early times several laws have been passed, all of them to fortify and to improve practically the dispositions of the code of 1827. One of them is the law of 1860, which provides that every landowner who possesses mountain slopes is obliged, whether he wills or not, to reforest them if denuded. In 1882 a new law, perhaps a little less stringent, but more practical, was enacted. According to this law, which is still in force, the Government has the right to serve an injunction on any owner of mountains who has not reforested them. The owner has the right to refuse, and in that case the Government expends a fair sum of money and plants the trees for the good of the community. The results have been very happy. In every part where these rules have been applied it is noted that the timber trade has been regulated, that the water supplies from springs have been more regular. The replanting in the south of France has evidenced once more what Mr. Roosevelt so well said, that the planting of trees abates the force of the wind. And there in the south of France, where terrible winds are the cause of so much havoc, the reforestation has been the means of their abatement to a considerable extent. * * * In the same manner another great mischief was being done along the coast of the ocean. For years and for centuries the sand encroached upon the land. Part of it was becoming a desert, and as the years went on the sand invaded the country more and more; it was like a death powder covering our country. Exactly a century ago we thought a stop should be put to it, and we thought of that great friend of man, the forest, and the forest did not fail us. Trees now cover all that sand country, and it has become one of the most useful in France. And now villages and towns have grown

[a] The French forests cover an area of 23,517,485 acres, or nearly 18 per cent, of the total land surface. The net annual yield is approximately $2.50 per acre, or, in all, about $58,793,712.

where before there was nothing. * * * This is the sort of policy we follow in France. It has given us very good results, and I am sure when you feel the need you will follow it in this country with splendid success.

HON. JAMES WILSON,

Secretary of Agriculture.

* * * Forestry is not a local question. It is as wide as American jurisdiction. It is not a class question; it affects everybody. It is not limited by latitude or longitude, by State lines or thermal lines, by rivers or mountain ranges, by seas or lakes. * * * Your presence here is the best possible proof that forestry is rapidly taking its place as an active and indispensable factor in national economy. The era of forest agitation alone has passed. We are talking less and doing more. * * * The nation is awakening to the necessity of planting trees and making the most of those that are mature. Our institutions of learning are taking up the study of forestry. State societies are inquiring. The experiment stations of the several States and Territories are making research. The Department of Agriculture is training a bureau of forest experts in woodcraft to serve the Nation, the States, companies, and individuals along forestry lines.

Reforesting of large areas is being carried on by the Bureau of Forestry and by several States, for the purpose of giving object lessons to our people with regard to methods of planting and varieties of trees. The farmer is planting for windbreaks and fuel, and in many cases he is planting valuable varieties for coming generations.

Cooperation between the Department of Agriculture and States, companies, and individuals is progressing rapidly. Our trained foresters are getting into touch with the college and experiment station forces of the States, with companies that hold woodlands for present and future use, and with individuals. * * * Congress is giving liberally to forest research, enabling us to do systematic work with wood in all its uses.

The future requires forest planting at the sources of all our streams that are not now protected by trees, to make the hills store up water against time of drought and to modify the flooding of the lowlands. We have to tell the people of the lower Mississippi every few years to raise their levees to restrain the floods that exceed themselves because the remaining forest no longer regulates the waters that were in previous years absorbed by the hills and held back.

* * * * * * *

Unless those who represent the business interests of the country take hold and help, forestry can be nothing but an exotic, a purely Government enterprise, outside our individual life, and insignificant

in its influence on the life of the Nation. Without forestry the permanent prosperity of the industries you represent is impossible. The vast area of the timberlands of the United States is mainly in the hands of the lumbermen, who have it in their power, by putting forestry in effect on the lands they own and control, to make the lumber industry permanent, and they will lose nothing by it. If they do not, the lumber industry will go the way of the buffalo. The regulation of grazing on the public forest land is a forest question, and, like all other national forest questions, its settlement should always be for the best interests of the people most deeply interested.

* * * * * * *

I am particularly glad that this congress will include a full discussion of national and State forest policy. The forest movement in several States has already resulted in the adoption of definite State forest policies. In other States the time is ripe for useful work.

* * * * * * *

Every tree is beautiful, every grove is pleasant, and every forest is grand. The planting and care of trees is exhilarating and a pledge of faith in the future; but these æsthetic features, though elevating, are incidental. The people need wood. They have had it in abundance and have been prodigal in its use, as we are too often careless of blessings which seem to have no end. Our history, poetry, and romance are intimately associated with the woods. Our industries have developed more rapidly because we have had plenty of cheap timber. Millions of acres of bare hillsides that produce nothing profitably should be growing trees.

HON. FRANCIS E. WARREN,

United States Senator from Wyoming.

* * * The beneficial object of the withdrawal of the forests of the West from unrestricted public use and their creation into reservations has the indorsement of residents of Western States, even though the public-land area of those States is seriously diminished. The western people, patriotic in all things, acquiesced in the intrenchment upon their States for the general public good. Although the creation of forest reserves and forestry regulations often works hardship to individuals and to communities, there is no branch of the Government which has more loyal support from western citizens than has the forestry service. Happily the idea of withdrawing the reserves from all use has year by year lost its potency. Investigation, examination, and experience demonstrated that the reserves could best be preserved by judicious use, and the welcome words of President Roosevelt, in his latest message to Congress, coincide with the views which have been held by many western citizens since the creation of

the reserves, and they illustrate also how closely and clearly the President is in touch with western needs and interests. In his message he said:

It is the cardinal principle of the forest reserve policy of this Administration that the reserves are for use. Whatever interferes with the use of their resources is to be avoided by every possible means.

HON. JOHN LAMB,

Representative in Congress from Virginia.

* * * Could the farmers of the South Atlantic States be persuaded to adopt the intensive system of farming and have their poorer lands grow up in timber, they would improve their own condition and hand down to their children valuable possessions. * * * The disastrous results of the freshets caused by the removal of the forest from the sources of the rivers can not be learned from any statistics. The report made to our committee of agriculture shows a distressing condition, and one that appeals strongly for Federal and State legislation. Many valuable farms have been impaired in value and some utterly destroyed by the sand and débris washed down by the overflow.

HON. JOHN F. LACEY,

Representative in Congress from Iowa.

I was born in the woods of Virginia. I moved to the prairies, and one of the most unpleasant things of my subsequent life was to return to the woods of Virginia and find that the old streams and the holes we used to swim in and where we used to go fishing are now gravelly roads. They are highways as dry, as arid, as one of the deserts of Arizona or New Mexico. Why is it? Because the trees have been cut down and the springs, the children of the forest, dried up. Instead of a slow-running brook digging out holes here and there clear as crystal, we have simply a torrent carrying the pebbles and sand from the hills, and then a desert. * * * While preserving the forest you will preserve the creatures that dwell there. A man or woman who preserves a tree in a practical way will preserve the things the tree shelters and produces and that are useful to man.

HON. W. A. REEDER,

Representative in Congress from Kansas.

* * * The district which I have the honor to represent is a prairie country, and has greatly felt the need of protective belts of trees. I am very glad that the Bureau of Forestry is so successfully assisting the western farmers in establishing windbreaks. * * * At the irrigation convention at El Paso I heard strong resolutions

for the repeal of our present noxious land laws, and here I hear the same sentiments expressed. We have $25,000,000 in our great irrigation fund, which will in the next few years make homes for 1,000,000 people and the fund remain intact. This fund would have been at least $60,000,000 greater had the timberlands which have passed into private control within the past three years brought their real value.

N. W. McLEOD,

President National Lumber Manufacturers' Association.

The facts that deeply impress an individual are those in which he is personally interested. The lumberman in surveying a forest centers his attention on that part of it that he can utilize in profitable conversion into a commercial commodity. The young and immature timber is only considered by him an obstacle, increasing the cost of transportation of the mature timber to the manufacturing plants. The forester, on the other hand, is attracted to the young and immature timber that promises a future profit. * * * In order that cooperation may be obtained, the forester must by careful investigation understand some of the economic problems that confront the manufacturer. The individual operator has always had to consider two things—first, the necessity of employing a larger investment; second, competition of manufacturers who are operating regardless of forestry considerations. This competition during periods of general commercial depression might force the manufacturer operating under forestry regulations to run his plants at a loss or to suspend operations until the conditions of supply and demand were favorable. But that forestry is practicable where there are large holdings of timber, either by private ownership or by the Government, is unquestioned by all who have given the matter careful thought. * * *

F. E. WEYERHAUESER,

Weyerhaueser Lumber Company.

Everywhere throughout our timber regions nature is struggling to renew her growth, and mere casual observation forces upon us the fact that the forests will reproduce themselves if given a fair chance. But there are three great obstacles which must be reckoned with in the profitable reproduction of timber, namely, time, fire, and taxes. * * * Few lumbermen have watched the growth of timber long enough to know what its increase is. Forest growth varies greatly in different climates and different varieties of trees in the same climate. Before he can consider forestry, the lumberman must know the rate of annual growth and the cost of protecting the forest. This information the forester is able to give him. In other words, the forester tells him how long it will take to produce a merchantable

tree and the average product per acre. Knowing these facts, it is comparatively a simple matter to determine whether a given forest can be maintained and yet made to yield satisfactory returns to the owner. The next obstacle, more important because harder to overcome, is fire. I am frank enough to say that in this matter lumbermen themselves are largely responsible, sometimes even to the extent of fighting reform. But the lumberman is not only culprit but sufferer also, and he must be protected in this loss from fire by the rigid enforcement of proper laws. With a sufficient patrol during dry seasons, and reasonable care on the part of those who start fires, this source of awful destruction can certainly be checked, though it can never be entirely eliminated.

The final obstacle is taxes. If anywhere, it is here that lumbermen practicing forestry under present conditions will be checked, for the lumberman more than any other manufacturer is the subject of heavy taxation. This policy of drastic taxation results inevitably in the slashing of the timber and the complete destruction of the forest. Assuming that the land held for forestry purposes is valuable for timber, the State would far better collect a low annual tax over a long period of years than levy a heavy tax for a short period; and this is obvious when we consider that an important industry is thus maintained and a considerable and constant pay roll secured. * * * Practical forestry ought to be of more interest and importance to lumbermen than to any other class of men. At present lumbermen are ready to consider seriously any proposition which may be made by those who have the conservative use of the forests at heart. Private forestry is practicable, and can be applied profitably under favorable conditions.

JOHN L. KAUL,

President The Kaul Lumber Company.

My acquaintance with the southern-pine belt has extended over a period of seventeen years. During that time I have constantly observed the deplorable effect upon the forest of lumbering without regard to the future. The cut-over lands have no general value for agriculture. Their best use is for the growth of timber. A large amount of small timber was left standing on these lands after lumbering because it did not pay to handle it. This situation prompted the company to give serious consideration to the practicability of introducing modifications in the method of lumbering which would insure the leaving, in good condition, of a sufficient basis for another crop. * * * I am free to confess that I turned to forestry with some doubts. I was not entirely sure that its policy, admirable in the abstract, concerns itself sufficiently with business considerations

to be of real use to the actual operator; but in taking up, on our own ground, the forest problems which confronted us, the Bureau of Forestry has demonstrated, on our tract at least, the eminently practical character of its work. Actual measurement of the forest on 5 per cent of the lands developed the fact that by curtailing the present cut by less than 20 per cent, the company could, after twenty years, again obtain an amount equal to 45 per cent of the present cut. This, at the present value of stumpage, figuring at compound interest, is a 2 per cent investment, but assuming a rise in stumpage value to $5, it is a 6 per cent investment. Should the value of stumpage reach $10 per thousand, which we confidently believe will be the case, the value of the timber in twenty years time will represent an investment of 10 per cent. Included in the calculation is a liberal allowance for the value of the land and of the timber held over, and for taxes and for cost of protection. * * * The timber which the company leaves standing after lumbering consists entirely of small trees below 18 inches in diameter on the stump, the value of which is considerably below the average run of the forest. Every tree contains more or less material which produces lumber of so low a grade that it hardly pays the cost of manufacture, for the smaller trees saw out the grades of low value in far greater proportion than the larger trees. * * * An extensive investigation was made in our sawmill at Hollins, Ala., to determine the amount and comparative values of the grades which trees of different sizes will produce. The result of this experiment proved conclusively the relatively low value of the lumber produced from small trees, and was an important factor in influencing the company to lumber conservatively; in other words, it went still further to establish the bad business policy of putting small trees into the mill rather than leaving them to reach a more profitable size.

J. E. DEFEBAUGH,

Editor American Lumberman.

* * * The lumbermen of the country have keen interest in the work which has already been done by the Bureau of Forestry and in other practicable features of its work which have been hardly more than initiated. * * * They have viewed with concern the rapid disappearance of their woods, and have to a large degree come to a realization of the serious meaning of the annihilation of their forests. * * * Within a few years there has been a marked change among lumber operators in this respect. This has come about largely because of the increased wealth and intelligence of the men who now control a large percentage of the merchantable timber of the country. It is impossible that such men should not realize the importance and

benefit expressed in the term " forestry." They are in favor of forest reserves, properly administered, in certain portions of the country where such reserves will do the most good. They indorse the wisest and most thorough economy in the management of their own forest holdings. They would be glad of any plan for economical cutting and marketing that would be an improvement on present methods. Indeed, the tentative efforts that have been made in these directions by owners of yellow-pine stumpage in the South proves this. These owners have seen how northern pine has been slaughtered to near exhaustion and wish to avoid such a precipitate, headlong rush toward the end.

GEORGE H. EMERSON,

Vice-President Northwestern Lumber Company.

* * * To teach the people to utilize the product of our forests by clearing the land of all things of value is one of the great duties of those who are anxious to see our forests perpetuated. * * * The bark of our hemlock is superior in tanning qualities; tanning-extract plants could help solve the problem; pulp mills could use to advantage our hemlock and waste spruce; fir tops, stumps, and roots are well supplied with pitch, and experiment indicates that the values obtained from those sources in turpentine, tar, pitch, rosin, wood alcohol, creosote and other chemicals, lampblack, and charcoal are greater than the balance of the tree affords in lumber. * * *

When our timber is utilized as our cattle and hogs are utilized, and every part saved, the other things required to perpetuate our western Washington forests will follow as good investments.

JOHN A. McCANN,

Editor National Coopers' Journal.

The cooperage people who own timber, and timber owners generally, should be educated to their necessities in three ways: First, the need of an intelligent appreciation of the value of timber; second, the need of caring for timber from a physical standpoint; third, the manner in which to accomplish these ends. * * * Necessity has compelled us to see that beech, maple, and birch will take the place of elm and basswood for slack cooperage work, and we are also learning that gum, when properly handled, will make the best of barrels, and I presume that there are other timbers growing in our forests that only need intelligent handling to become equally valuable. Whatever the American Forestry Association or the Bureau of Forestry can do to demonstrate this, to prevent waste and destruction by fire and parasites, and to renew supplies, will be work well done.

M. C. MOORE,

Secretary National Slack Cooperage Manufacturers' Association.

* * * I am sorry to say, because I believe that it ought not to be so, that American manufacturers of lumber and cooperage stock are, as a rule, looking no farther ahead than the length of their own lives or their own active business careers, as far as the consumption of timber is concerned. * * * How are we going to induce the manufacturer to look at this thing differently? * * * There is one fact which seems to me generally encouraging to the application of the principles of forestry. This is that hardwood tracts which were cut over by manufacturers a few years since and deserted as exhausted are now being logged again.

GEORGE W. HOTCHKISS,

Secretary Illinois Lumber Dealers' Association.

* * * It has been claimed that the lumber industry is the fourth in rank of the Nation. I claim that it is the first in rank, as I figure that in the past one hundred years a moderate estimate gives us from 2,000 billion to 2,500 billion feet as the product of the forests of the Nation, which I estimate to be of a financial value equal to from one-quarter to one-third of the estimated wealth of the Nation. * * * From these vast figures will perhaps be realized the importance of the forests of the Nation to its development, for through them, and them only, has been made possible the great development of the West—of the prairie States—as well as of the East. * * *

GEORGE K. SMITH,

Secretary National Lumber Manufacturers' Association.

* * * The importance attached to statistics in other commodities is well illustrated by the annual report of the Statistician of the Department of Agriculture for the fiscal year 1903, published in the December issue of the Crop Reporter. The fact that our Government has made the Census Bureau continuous in its organization and reduced the period of census returns from once in ten years to once in five years is another evidence of the importance of up-to-date statistics. * * * Such gatherings as this congress tend to hasten the day when the manufacturers of lumber and owners of stumpage will work closer together and determine annually how rapidly our forest resources are diminishing, and thus realize more and more the importance of statistics in the lumber industry.

HOWARD ELLIOTT,

President Northern Pacific Railway.

* * * To have good tracks the railroads must have some form of support under the rails, and the present practice is a wooden tie.

In this item alone, based upon the actual requirements for a period of years by one large system, it is estimated that the total annual consumption of ties, for renewals only, by all the railroads of the United States, is at least 100,000,000, to which add 20,000,000 for additional tracks and yards and for the construction of new railroads, and the total is the equivalent in board measure of more than 4,000,000,000 feet. The significance of these figures is more apparent when it is remembered that about 200 ties is the average yield per acre of forest, varying very greatly in different localities; so that to supply this single item necessitates the denudation annually of over one-half million acres of forest. But the cross-tie supply is only one of the forest products required by the railroads. There are bridge timbers, fence posts, telegraph poles, car materials, and building timbers of all kinds, all of which it is estimated will nearly equal in board measure the cross-tie item, so that it is probable that the railroads of the United States for all purposes require annually, under present practices, the entire product of almost 1,000,000 acres of the forest. * * * If the American railroads are to continue to be the efficient commercial tool that they now are, to continue the very low average rates and the high scale of wages now in effect, the question of the increased cost of ties and timber is of greater and greater importance to those who pay transportation charges, to wage-earners, and to railroad owners. The fact that so many large interests are dependent upon the wise handling of the forests remaining in this country will insure a greater cooperation in the future than there has been in the past between those who cut down and use the forests for money-making purposes and those who are studying the subject in order to safeguard the interests of those who come after us.

JAMES J. HILL,

President Great Northern Railway Company.

[Extract from a letter to the President of the Congress.]

I very much regret my inability to be present at the Forest Congress. The subject is of importance far beyond the general understanding of the public. The growth of population in the United States has practically covered all the land which can be cultivated with a profit without artificial moisture. Irrigation and forestry are the two subjects which are to have a greater effect upon the future prosperity of the United States than any other public question, either within or without Congress.

CHARLES F. MANDERSON,

General Solicitor Chicago, Burlington and Quincy Railway Company.

* * * A future timber supply demands not only the preservation by judicious forestry and intelligent lumbering the store we have,

but the planting and husbanding of new forest wherever trees can be induced to grow. To this end there must be the arousing of public sentiment so that in every State, and in the Nation, there shall be taught the lesson that will lead to legislation encouraging timber growth. * * * We should rejoice in the fact that in this movement, fraught with so much good to the Republic, sentimentalism joins hands with commercialism. * * * The experiments of the Government, of the railroads, and of private parties to prolong the life of timber are of great importance. The saving to the forest, if the life of a tie can be prolonged, will be very great, for as yet no substitute has been devised for wood ties that is economical or desirable. They maintain the alignment of the railroad, so essential to safety, better than any metal substitute, and give an elasticity to the roadbed most important for the preservation and maintenance of the rolling stock.

L. E. JOHNSON,

President Norfolk and Western Railroad Company.

* * * The preservation of forests is not only necessary for supplying railroads with cross-ties, with timber for their trestles and cars, but is necessary to maintain the supply of wood for the various manufacturing, building, and domestic purposes of the public. * * * Our population now is becoming so congested, and the demands upon the resources of the country so great, that it is necessary for intelligent and conservative people to study the forestry question and other like propositions, to the end that the resources of the country shall not be wasted to such an extent that the conditions of living by our people shall become difficult. I know of no single question that is entitled to more consideration by people influencing the large corporations than the timber and forestry question.

J. T. RICHARDS,

Chief Engineer, Maintenance of Way, Pennsylvania Railroad System.

* * * The number of cross-ties in use on the railroads of the United States is estimated to be about 620 million; the number used annually for repairs and for extensions of track is estimated to be from 90 to 110 millions, requiring, we may say, the entire product of 200,000 acres of woodland annually. Each year the timber from which these are manufactured is farther from the base of transportation. * * * Recently the yellow locust as a tie timber has been brought to our attention, and the cultivation of this tree to a limited extent for tie purposes has been undertaken. Within the last two years we have begun the planting of yellow locust trees on an extensive scale on property owned by the company. The total quantity planted to date is 280,530 trees. During the coming year we expect to plant about 800,000 more.

T. J. GRIER,

Superintendent Homestake Mining Company.

Forests are important to mining, and benefits accrue to mining from forests, but it is not sufficient to say so and there stop. The forests are an absolute necessity to the mines. Nor is it true to say that the timber produced by the forests is the only benefit accruing from them. Conservation of moisture by a thrifty growth of trees is to the credit of the forest while alike important and necessary to the mineral industry, and when that moisture is thus conserved it becomes invaluable as it flows on to such agricultural areas as may be adjacent to the mineral lands. * * * Not many, perhaps, fully appreciate the enormous quantity of timber needed in and about a great mine in order to carry on its operations and protect the lives of its operatives. The hoisting-works, metallurgical, and other buildings on the surface, which are always in sight, perhaps make the average mind more or less oblivious to the fact that further supplies of the forest product are required with every foot of progress made in penetrating the ground. As the miner's work of taking out the ore advances he surrounds himself with a framework of timber, which is intended to hold in place the sides and roofs of his excavations.

CHARLES D. WALCOTT,

Director United States Geological Survey.

* * * Abundance of wood is one of the prime necessities for successful mining. There are four chief factors in the mining enterprise—the value of the ore, the cost of production, the cost of transportation, and the cost of reduction; and the sum of the last three must be less than the first or the mine will be closed. Mining properly understood is a business in which the profits or losses are the result of the balance of these conditions, not an excavation of treasure whose enormous value renders other considerations insignificant. Now, in the three costs mentioned above, the principal elements are water and wood. * * * The miner has a great and vital interest in the permanent preservation of the forests and in their intelligent utilization second only to that of the irrigation farmer. He should be one of the strongest supporters of the Government in its attempts to preserve our woodlands and make them useful to all interests.

DAVID T. DAY,

Chief of Division of Mining and Mineral Resources, United States Geological Survey.

* * * The miner has established his reputation as a good customer to the lumberman, and is daily becoming a better customer. * * * For every ton of anthracite coal taken out of the mine we

must put back a cubic foot of timber—that is to say, 70 million cubic feet per year for the anthracite industry alone. * * * Four hundred million cubic feet a year will hardly suffice for the underground work in mines. This fact establishes a place for the mining industry as a good customer to the lumberman and emphasizes its interest in the maintenance of the timber supply.

F. H. NEWELL,
Chief Engineer, Reclamation Service.

* * * The Government, through the operation of the reclamation act of June 17, 1902, is building large irrigation works throughout the West. The fund for that purpose now amounts to about $25,000,000, and large works, national in character, are being built as rapidly as possible. The protection of these works, their future use, their stability through all time, are very largely dependent upon the proper treatment of the forests which lie upon the mountains above the reservoirs. In fact there is hardly a project which is under consideration which is not very closely joined with the questions of the best use and the best preservation of the forests, and perhaps of the grazing land immediately adjacent to or above them. If these great works, which are built, as I have said, to last for all time, are to be preserved, it can only be after we have solved this whole question of the best use of the forests. * * * Forest protection has an important, practical, definite value not only to the people of the West, but to the people of the whole country, in the making of homes and making possible the maintenance of a large population. This population will support itself from the soil of the West, and will draw upon the East for its manufactures, and draw upon the transportation interests of the whole country to carry those manufactures.

GUY E. MITCHELL,
Secretary National Irrigation Association.

In the western half of the United States the destruction of the forests has an intimate bearing upon the capacity of the State to sustain population, for population results from irrigation, irrigation depends upon water supplies, and the water supply is furnished from the melting snows caught and held by the forest clothing the great mountain chains of the Sierras and the Rockies. * * * What is needed to-day is vastly more strength to the arm of American forestry for the vigorous prosecution of its carefully outlined plan to save what we now possess.

J. B. LIPPINCOTT,
Supervising Engineer, Reclamation Service.

* * * A striking example of the output of a barren, treeless drainage basin is shown in the case of Queen Creek, Arizona. This

stream discharges only in violent freshets, recurring usually as great flood waves, subsiding almost as rapidly as they arrive. During the larger part of the year the channel is almost dry. The area of the drainage basin is 143 square miles. * * * In contrast with Queen Creek is Cedar Creek, in Washington. The drainage area is the same as that of Queen Creek. It is heavily timbered, and in addition the ground is covered with a heavy growth of ferns and moss. The total annual rainfall in the Cedar Creek basin in 1896 was about eight times that in the Queen Creek basin, yet the maximum flood discharge per second is only 3,600 cubic feet for the former, while the maximum for the latter was 9,000 cubic feet per second. The mean discharge for Queen Creek was 15 cubic feet per second, and for Cedar Creek 1,089 cubic feet per second. These two streams represent extreme types. The radical difference in their character is believed to be largely due to the difference in forest cover.

A. P. DAVIS,

Assistant Chief Engineer, Reclamation Service.

* * * The development of irrigation will in the future lead to the rapid opening and development of timbered areas which are now merely in their natural state. This fact emphasizes the necessity of placing the forests at once under the rigid scientific supervision of trained Government experts. If left to the manipulation of selfish interests, as in the past, the result will be lavish and wasteful use and probable destruction of the forest. * * * Eventually the forest must be replanted and restored at enormous expense of time and money, which can all be saved by a wise supervision, without diminishing the present utility of the forest or destroying its future value, by merely protecting and fostering the tendency of nature.

E. S. GOSNEY,

President Arizona Wool Growers' Association.

* * * The necessity for the fullest protection of the homes of our country and the builders of those homes is seldom realized and never overestimated. * * * This is especially true of the western forest reserve management, because it embodies a radical innovation on the customs, rights, and life of the people. They dwell in the towns, villages, and the country throughout these reserves, and in the irrigated and unirrigated districts below and about the reserves. They are cattlemen, horsemen, sheepmen, farmers, or miners, as the case may be, and the confidence and cooperation of each of these men, especially the stockmen, is necessary to a full protection of the forest reserves and a full realization of the high purposes of forestry.

A. F. POTTER,

Bureau of Forestry.

* * * The Government realizes the importance of the livestock industry to the prosperity of the Western Commonwealths, and that a very large proportion of the people are directly dependent upon it for the support of their homes. * * * Care has been taken in the preparation and enforcement of grazing regulations to avoid, as far as possible, any unnecessary disturbance of business by sudden changes in the manner of using the grazing land. An effort has been made to fit the regulations to the actual needs of the reserves and to allow every privilege consistent with their proper care and management.

HON. W. A. RICHARDS,

Commissioner General Land Office.

* * * The use of the forest reserves granted to the public is considered a privilege and not a right. It may be refused in any case, but as a rule settlers, farmers, prospectors, and others who so desire may secure, free of charge, all kinds of timber for domestic uses, such as firewood, poles, and logs, and if really needed, matured green timber. * * * Corporations or persons desiring to obtain timber from the forest reserves for commercial use are required to purchase the same, and in every case they are required to utilize all the timber either for lumber, firewood, or other purposes, and to pile the brush so that it can be burned without injury to the living timber. * * * Whenever it appears that grazing will not damage a forest reserve or prevent reforestation it is allowed to such an extent as careful investigation warrants, so as to prevent any injury by overgrazing. In practically all the reserves, cattle grazing is allowed, but sheep grazing is prohibited in some localities where it is likely to injure the forest cover or the young growth.

F. A. FENN,

Supervisor of Forest Reserves in Idaho and Montana.

* * * The honest prospector and the bona fide miner have nothing to fear from the forest reserve. As the forest policy shall be elaborated and adapted to the local conditions the administration of the reserves will be improved and the interests of the mining industry be enhanced. Examined from the viewpoint of experience, the relation of forest reserves to the mining industry appears so intimate, the success of one so directly interwoven with and dependent upon the continued prosperity of the other, that the possibility of real antagonism between them can not be entertained.

SETH BULLOCK,

Supervisor of Black Hills Forest Reserve.

* * * A practical administration of the forest reserves, one that takes into consideration not only the preservation and propagation of the timber, but the necessity of the mine as well, will not, in my opinion, retard the development of mining, but on the contrary will materially assist it. * * * It can be truly said that a veritable forest has been used underground in the mines of the Black Hills during the few years they have been in operation.

CAPT. GEORGE P. AHERN,

Chief Philippine Bureau of Forestry.

* * * There is a vast natural forest wealth in the Philippines waiting development. * * * This archipelago is one of the fertile spots in the Orient. The market for our product is strong and close at hand. Labor is not very difficult to procure, and ample protection is secured to life and property. * * * The Pacific is indeed an American ocean; we have the choice islands in that great sea, and we have the most fertile spots at the gates of China.

AUBREY WHITE,

Commissioner of Crown Lands, Province of Ontario, Canada.

So far as the Province of Ontario is concerned, we derive our principal revenues from the sales of pine timber, there being no state tax. We do not pay one five-cent piece for state purposes. * * * Our great revenue comes from two sources: One, a grant by the Federal Government, and the other, the proceeds of the sale of our timber. This last year we derived from timber alone $2,800,000. When we want to dispose of our timber we survey it into blocks, or " berths," as we call them, and invite people to come and bid for them. * * * We sold one square mile at our last sale and got $36,500 for it. So we have a very valuable asset and are taking care of it—we are not giving it away.

A. L. FELLOWS,

Consulting Engineer, U. S. Geological Survey.

One of the greatest needs that this country has to-day is a cheaper form of power, so that industries as yet undeveloped may in their turn add to the national life. * * * Electrical power may be generated in many ways, but in none more practically than by the use of water. We here avail ourselves of one of nature's resources without in any way exhausting her reserve supplies, as is done in the present wasteful use of coal. * * * The development of electrical energy

on a commercial basis upon a given stream and with a given fall will depend upon a variety of conditions, and in nearly every one of these conditions the forestation or lack of such upon the headwaters of the streams plays an important part. * * * Those regions that approach most closely to ideal conditions are those which are densely forested, and can therefore act as conservatories of the water supply with the least artificial aid.

MORRIS BIEN,

Engineer, Reclamation Service.

* * * The present laws relating to rights of way upon the public lands, as well as upon forest reserves, are such as to facilitate the operations of speculators to obtain, secure, and retain command of controlling points for the use of water for railroad, irrigation, power, and other purposes. * * * It is important, however, for the proper development of the entire West that these unused rights of way should be canceled at the earliest possible date, for the reason that as soon as any bona fide enterprise is started, these rights, which are practically dead, are at once revived and the owners make enormous claims for the rights which they hold and which can not be set aside without such delay as to seriously jeopardize the proposed development.

B. LAWTON WIGGINS,

Vice-Chancellor University of the South.

* * * There is no profession I know of that requires wider knowledge than does forestry. Since he deals scientifically with the soil and the products of it, the forester must be much of a geologist, botanist, zoologist, and chemist. The harvesting and manufacture of his crop calls for no mean engineering skill and knowledge. The management of his property is likely to call for legal knowledge. And so on through many other essentials in his education, which only a real university can give him. * * * We are about to see the proper university recognition given to the callings upon which so much of our national welfare depends—*agriculture*, the production and harvesting of field crops; *silviculture*, the production and harvesting of forest crops.

FILIBERT ROTH,

Professor of Forestry, University of Michigan.

* * * In Michigan we have been nearly a century hewing out of the forests the homes of more than 2,000,000 people. Our lumbermen have provided the lumber to build homes in the prairie States from the Dominion to Texas. Had we continued with the old-fash-

ioned saw we would still have had white pine to sell. Working with steam and electricity, we went far beyond the mark. * * * We have awakened, and the State of Michigan has now a forestry commission which looks after the forest interests of the State. It is teaching its young men to take care of the woods at its two great institutions—the university and the agricultural college. * * * The business men of every city in the State are as one in seeing that something must be done right away, and that the only question is, What shall we do?

L. H. PAMMEL,

Professor of Botany, Iowa College of Agriculture and Mechanic Arts.

* * * The free use of our public domain for everyone destroys the range to such an extent that the sheep men are forced to use the forest areas. Free range should be abolished. * * * In the Bitter Root Forest Reserve, where grazing is carefully regulated, the water supply from the mountains is scarcely diminished, although larger quantities of water are used than formerly. The most important factor to be observed in this reserve is that the young trees are coming up everywhere in great numbers. * * * In the Uintah Forest Reserve there can be no doubt that the most important factor in diminishing the water supply is injudicious grazing.

REV. EDWARD EVERETT HALE,

Chaplain of the United States Senate.

I have slept under pine trees which were high, tall, and beautiful when North America was discovered. I went up through the same region two years ago with a friend and found my pine trees all gone and sumach and blackberry bushes in their places. It makes a man cry to see it. Now we are before Congress because we want Congress to preserve the forests for 50 square miles in that region. I desire that my boy's boy's boy's boys and girls two centuries hence shall see such pine trees as I saw in 1841.

WILLIAM S. HARVEY,

Delegate from Pennsylvania.

The Appalachian Forest Reservation, the purchase of which has been indorsed and advised by commercial bodies throughout New England and the East, by various forest associations, and by the National Board of Trade, is of vital interest to the whole people. The Southern States have more than 200 millions of dollars invested in cotton mills. These cotton mills are in a large measure dependent upon water power. * * * The taking of the forest cover from

the Appalachian Mountains will largely destroy the opportunity which nature has given the South to increase in wealth and prosperity. Upon the continuance of this forest cover depends almost entirely the water power, navigation, and agriculture of the region south of the Ohio and Potomac rivers and east of the Mississippi.

MRS. LYDIA PHILLIPS WILLIAMS,

Federation of Women's Clubs.

I want to extend to you the fraternal greetings of the Federation of Women's Clubs, 800,000 strong, a reserve force which to-day is increasing, and whose interest in forestry is perhaps as great as that in any department of its work. The department of forestry in the federation was created only two years ago, yet at the biennial meeting at St. Louis in May only two departments could show as great an increase in interest. * * * In the two years and a few months since that time, 38 federations have formed forestry committees, which are enthusiastically spreading the propaganda for forest reserves and the necessity of irrigation.

GEORGE H. MAXWELL,

Executive Chairman, The National Irrigation Association.

* * * There is absolutely no question before the people of this country to-day that has as much interest to the commercial, manufacturing, and mining interests of this country, to say nothing of agriculture, as the one question of forestry. It is not a western question nor an eastern question; it is a national question.

OVERTON W. PRICE,

Associate Forester, U. S. Department of Agriculture.

* * * The cooperative work of the Bureau began in 1898, with an offer of assistance to private owners in the handling of their woodlands. From this beginning it has broadened as the direct result of an insistent demand, until it now offers assistance not only in the preparation of working plans, but also in tree planting, either for commercial purposes or for protection, and in discovering the most conservative and profitable methods for the use of the products of the forest. * * * Not only has it brought about the use of new and better methods on the ground, but, above and beyond the benefit to the individual cooperator, this work, through the publication of its results, has been a far-reaching influence in furthering the understanding of the purpose and methods of forestry, without which its general application is impossible. Thus the results of the cooperative work can not be measured alone by the great areas of forest land now

under management as the result of working plans prepared by the Bureau, or of the 370 planting plans which the Bureau has prepared for lands in 52 States and Territories. * * * The area in woodlots and timber tracts in this country is approximately 500 million acres. It is from them that our future timber supply must chiefly come, and the inauguration of better methods in their management is thus a national duty, until the private forester is present in sufficient numbers to carry on the work. When that time comes the Bureau will step aside.

B. E. FERNOW,

Forest Engineer.

* * * Wood prices, even in the United States, have been rising continuously for the last seventy years, at the rate of about $1\frac{1}{2}$ per cent a year. * * * In the last forty years the industrial nations of the earth, such as England, France, and Germany, have increased the wood consumption to a marvelous extent, not according to the number of their population, but an increased per capita consumption. This is a remarkable statement, when we know that stone, iron, and steel have taken the place of wood as building material, and that coal has replaced it as fuel. A supply for the future is one of the requisites of our modern civilization.

C. A. SCHENCK,

Forester to the Biltmore Estate.

* * * I am a lumberman, and as a lumberman I cut trees. * * * At the same time I am a forester, and as a forester I raise trees. * * * We frequently are of the opinion that these little trees, the second growth, are really the best money-makers. I think we might as well change our minds. * * * Stumpage prices are increasing very rapidly in this country; the big tree is the best money-maker. In 1895 and 1896 I sold many a fine white oak at 50 cents per thousand board feet; I wish I could replace them. I would gladly put them back into the woods at $4 per thousand, because they are worth $5. In 1898 I got for some trees $1.25 per thousand; in 1903 I received $2.50 for the same kind, and last year I found a gentleman who was willing to give me as much as $8 per thousand for them.

J. T. ROTHROCK,

Of the Pennsylvania Forest Reservation Commission.

* * * To-day Pennsylvania is in actual, or prospective, possession of about 700,000 acres of land, which has been purchased for the specific purpose of creating forest reservations, and thus to restore a better proportion between the wooded and the cleared areas of the

State. It has a department of forestry which ranks in recognized importance with those of public instruction, agriculture, and internal affairs. * * * It may be safely said that up to this time no legislature has ever denied what the forest officials of the State suggested, nor have we ever had a governor who failed most cordially and fully to support the forestry movement since it took its present direction. * * * The outlook for forestry in Pennsylvania is hopeful. Some of our laws may be improved, but we have no legal or constitutional restrictions upon us which interfere with the development of conservative forestry ideas or plans.

HERMANN VON SCHRENK,

Bureau of Forestry.

* * * There is probably no one to-day who does not believe that timber preservation in one form or another pays. The extent to which such preservation will pay will depend upon the cost of the wood, the cost of renewal, and the cost of the treatment. * * * Treated timber in almost every respect is cheaper in the long run than untreated timber; furthermore, the better treatments, although more expensive at first, are much cheaper in the long run.

GIFFORD PINCHOT,

Forester, U. S. Department of Agriculture.

* * * We recognize that the bulk of our forests are now and must always remain in the hands of private owners; that it is only as the private owner, large or small, becomes interested in forestry and carries out its practical principles, that we shall succeed in introducing forestry into the United States. It should be remembered by every forester, and every man interested in forestry, that the woodlands in farms are about three times as great in extent as all the national forest reserves, and that the reserves are almost insignificant when compared with the vast area of timberland, the millions upon millions of acres, which are owned by lumbermen in larger or smaller holdings, by railroads, or by men of various occupations who control the timberlands upon which the prosperity of this whole country depends. This is to be remembered, that the forests of the private owners will have to be set in order if the overwhelming calamity of a timber famine is to be kept from this nation. * * * The extension of the present forest area, by restocking cut-over lands and by making plantations where there are no forests, is one of the chief duties of the present moment. This will be accomplished by helping the States to formulate their own policies, by active cooperation in studying the local situation in each, and by recommending the best

procedure under the conditions that are found to exist. In particular, the farmers in every section of the country must be aided, either to develop their woodlots or to plant trees upon the prairies. * * * The forests now under Government control should remain under Government control so far as they are needed for public uses. We must have forest reserves, and we shall have to extend their area later on, not merely by Presidential proclamation, but by purchase, both East and West. Forest lands are passing out of the Government's ownership every day—lands whose preservation is absolutely essential to the well-being of the country where they lie. It will eventually cost the Government of the United States hundreds of millions of dollars to become possessed again of the areas which it once held, which are now in private ownership, and which are absolutely essential to the welfare of all of us. * * * I hope to see the Bureau of Forestry act as a helper and assistant, not only to the commercial interests, which is its first duty, but to all the interests of every kind that are in any way connected with the forest. And this not by interference or dictation. I should like to have every man and every woman in this convention go home with the idea that the Bureau of Forestry is the servant of every one of you, and asks nothing better, and can hope for nothing better, than to be called upon to give you help to the utmost limit of its power.

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"PRACTICAL RESULTS OF THE CUP AND GUTTER SYSTEM OF TURPENTINING". BY. CHARLES H. HERTY. 1905.

After a thorough search in the Department of Agriculture and Government Printing Office we were unable to locate a binding copy.